

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>PCT234/365KH</b>	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416	
International application No. <b>PCT/FI2005/050006</b>	International filing date (day/month/year) <b>14-01-2005</b>	Priority date (day/month/year) <b>15-01-2004</b>
International Patent Classification (IPC) or national classification and IPC <b>See Supplemental Box</b>		
Applicant <b>Metso Paper Inc et al</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:

☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand <b>19-10-2005</b>	Date of completion of this report <b>18-04-2006</b>
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer  <b>Mats Raidla/ELY</b> Telephone No. +46 8 782 25 00

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Cover sheet

International patent classification (IPC)

D21F 5/04 (2006.01)

D21F 5/18 (2006.01)

## Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into \_\_\_\_\_  
which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☐ the international application as originally filed/furnished
- ☒ the description:  
pages 1 - 15 \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:  
pages \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19  
pages\* 17 - 18 received by this Authority on 19 - 10 - 2005  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:  
pages 1 - 11 \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."



## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI2005/050006

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-13</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-13</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-13</u>	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:

D1: US 6442865 B1

D2: WO 9856983 A1

D3: US 4361466 A

D4: US 5865955 A

D5: WO 0236880 A1

The cited documents represent the general state of the art. The invention defined in amended claims 1-13 is not disclosed by any of these documents.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed arrangement in a paper machine or similar. Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in amended claims 1-13 is novel and is considered to involve an inventive step. The invention is industrially applicable.

19-10-2005

## Claims

1. An arrangement in a paper machine or similar, which includes a press section (11) equipped with one or more press nips (13.1, 13.2) and a dryer section comprising a web-supporting web transfer, a vertical impingement dryer (21) and one or more cylinder dryer groups, where the first dryer cylinder (14.1) of the first cylinder dryer group (14) is subsequent to the vertical impingement dryer (21), characterized in that the arrangement comprises a preimpingement dryer (20) with direct blowing against the paper web immediately before the vertical impingement dryer (21) for preheating the paper web before vertical impingement.
2. An arrangement according to claim 1, characterized in that the preimpingement dryer (20) is gas-operated and set to dry a different side of the paper web than the vertical impingement dryer (21).
3. An arrangement according to claim 2, characterized in that the preimpingement dryer (20) comprises a maximum of 50%, most preferably 15-35% of the total impingement length.
4. An arrangement according to claim 1, characterized in that the preimpingement dryer (20) is straight and the inclination deviates 60° at the maximum from the horizontal.
5. An arrangement according to any of the preceding claims 1-4, in which associated with the last nip (13.2) of the press section (11) there is a loop formed by a transfer belt (28), characterized in that the preimpingement dryer (20) is set on the said transfer belt (28).
6. An arrangement according to any of the claims 1-5, characterized in that the vertical impingement dryer (21) comprises two impingement dryers (21.1, 21.2) set on the opposite side of a down-extending web transfer, short in the machine-direction, arranged to dry the same paper web side.
7. An arrangement according to claim 6, characterized in that the vertical impingement dryer (21) comprises several rolls (21.4, 21.5), which support and lead the said down-extending web transfer of the dryer fabric 14.2 on the inner side of the fabric loop.

8. An arrangement according to any of claims 1-6, characterized in that the center line of the vertical impingement dryer (21) deviates a maximum of 35° from the perpendicular.
9. An arrangement according to any of claims 1-8, characterized in that the blast gas temperature in at least one impingement dryer (20, 21) is in a range of 250°C-700°C.
10. An arrangement according to any of claims 1-9, characterized in that the vertical impingement dryer (21) is set to dry unilaterally and the same side as the first subsequent dryer cylinder (14.1).
- 10 11. An arrangement according to any of claims 1-10, characterized in that the draw difference from the press to the first cylinder is arranged to be set below 2.9%, most preferably below 2.5%.
- 15 12. An arrangement according to any of claims 1-10, characterized in that for the vertical impingement unit there is—
- arranged an own fabric loop when the subsequent dry content - moisture is 48-54%, or
  - a fabric loop common with the short dryer cylinder group when the dry content - moisture after the blowing units is 52-57%, or
  - 20 - a fabric loop common with the long dryer cylinder group when the dry content - moisture after the blowing units is 56-65 %.
13. An arrangement according to claim 1, characterized in that preimpingement drying comprises a steambox (16.1).